Incentive design for social computing: Interdisciplinarity time!

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  - What do you view as the most important/interesting/exciting aspect of social computing?
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  - Design $\Longleftrightarrow$ Theory: HCI $\Leftrightarrow$ Theory $\Leftrightarrow$ Behavioral economics

Design ⇒ Theory

Incentive design for social computing: New theoretical directions

- Information elicitation with *endogenous* proficiency (Peer-grading)
  - [Dasgupta-Ghosh, WWW 2013]
- *Cardinal contests* (Crowdsourcing innovation)
  - [Ghosh-Hummel, WWW 2015]
- Multi-armed bandits with *endogenous* arms (Learning quality of user-generated content)
  - [Ghosh-Hummel, ITCS 2013]

Theory ⇒ Design: Game theory and interface design

Social-psychological rewards: Attention, status, virtual points, ...

- Modeling attention rewards: *Attention allocation as mechanism design*
  - [Ghosh-McAfee, WWW 2011; Ghosh-Hummel, EC 2011, ...]
  - Number of contributions to display, page breaks, ...
- Virtual point rewards
  - Best-answer mechanisms [Ghosh-Hummel, WWW 2012]
- Gamification: A game-theoretic approach
  - [Easley-Ghosh, EC 2013, Ghosh-R. Kleinberg, EC 2014]
  - Badge design (absolute vs relative, information about winners); badges vs leaderboards

Theory $\Rightarrow$ Design: Theory and behavioral economics

Incentives in crowdsourcing: 'Behavioral' design

- Effective incentive design: Accurate model of agents
- 'Real' users may not behave like 'standard' economic agents
  - Empirical, experimental studies on online platforms
  - Behavioral economics
- What does this mean for analytical **design**?

Incentives in crowdsourcing: 'Behavioral' design

- *What* agents choose amongst: Optimal contest design for *'simple'* agents
  - [Ghosh-R. Kleinberg, EC 2014]
  - Design: Badges or leaderboards, quantity vs quality, ...
  - Theory: LP techniques for contest design, subequilibria, ...
- *How* agents choose: Optimal contract *structure* in crowdsourcing markets
  - [Easley-Ghosh, EC 2015]
  - Expected utility: Fixed-payment contracts are optimal
  - Prospect theory: Contests can dominate, for real populations!

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- Takeaways:
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- Theory $\Leftrightarrow$ *Qualitative* design implications
- *Behavioral design*: Deviations from classical models 'matter'!

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    - *Available* rewards (Attention on YouTube: Number of views)
    - *Information* as design choice (What do agents know?)

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- Theory $\Leftrightarrow$ *Design* of social computing environments:

Behavioral science $\Leftrightarrow$ Theory $\Leftrightarrow$ HCI

Thank you!